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U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

**TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371**

ATTORNEY'S DOCKET NUMBER

205567-XXXX

U.S. APPLICATION NO. (If known, see 37 CFR 1.5)

10/089586

INTERNATIONAL APPLICATION NO.

PCT/IT00/00380

INTERNATIONAL FILING DATE

27 September 2000

PRIORITY DATE CLAIMED

30 September 1999

TITLE OF INVENTION

A GLASS FIBER COMPOSITION

APPLICANT(S) FOR DO/EO/US

LA GRECA, Marco; MASSINI, Roberto and PASALAIUGA HUGUET, Jorge

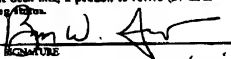
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.
4. ☐ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
- a. ☐ is attached hereto (required only if not communicated by the International Bureau).
- b. ☒ has been communicated by the International Bureau.
- c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
- a. ☒ is attached hereto.
- b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
- a. ☐ are attached hereto (required only if not communicated by the International Bureau).
- b. ☐ have been communicated by the International Bureau.
- c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
- d. ☐ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). **2 Declarations**
10. ☐ An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11 to 20 below concern document(s) or information included:

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included. **2 Assignments**
13. ☐ A **FIRST** preliminary amendment.
14. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
15. ☒ A substitute specification.
16. ☐ A change of power of attorney and/or address letter.
17. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1 821 - 1 825.
18. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
19. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
20. ☒ Other items or information:
A copy of the International Search Report
A copy of the International Preliminary Examination Report

JC13 Rec'd PGT/PTC 29 MAR 2002

U.S. APPLICATION NO. (37 CFR 1.51) 10/082386	INTERNATIONAL APPLICATION NO. PCT/US00/00380	ATTORNEY'S DOCKET NUMBER 203677-XXXX																												
21. <input checked="" type="checkbox"/> The following fees are submitted: BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)): Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.443(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or IPO \$1040.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or IPO \$890.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.443(a)(2)) paid to USPTO \$740.00 International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$710.00 International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) \$180.00 ENTER APPROPRIATE BASIC FEE AMOUNT =		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2" style="text-align: left;">CALCULATIONS PTO USE ONLY</th> </tr> <tr> <td style="text-align: right; width: 50%;">890.00</td> <td style="width: 50%;"></td> </tr> <tr> <td style="text-align: right;">\$ 890.00</td> <td></td> </tr> </table>	CALCULATIONS PTO USE ONLY		890.00		\$ 890.00																							
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SEND ALL CORRESPONDENCE TO: Berry W. Sufria Michael Best & Friedrich LLC 401 W. Michigan Ave., Suite 1900 Chicago, IL 60611																														
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A GLASS FIBER COMPOSITION

Description

5 The present invention relates to a glass fiber composition. In particular, the present invention relates to a biologically-degradable or bio-soluble glass fiber composition, adapted for production of panels and felts of glass wool. These goods are commonly used in the civil
10 and industrial field in the form of heat insulators and/or sound-proofing materials.

Presently known are many glass fiber compositions showing some biological degradability or bio-solubility
15 (solubility of a glass fiber in contact with a biological liquid). It is in fact to be recognized that the biological degradability in glass fibers was in the past and has been till now the object of many studies because a relation seems to exist between this biological
20 degradability and the cancerogenous properties that the glass fiber may show if it is introduced into or absorbed by a human or animal body.

In particular, it has been recently ascertained that a
25 higher bio-solubility can reduce the cancerogenous effects of the glass fibers increasing the capability of the human or animal body to get rid of the possibly-absorbed fibers.

30 In addition to bio-solubility, the glass fiber compositions of industrial concern must at all events also have an appropriate behaviour with reference to properties of physical, chemical and mechanical nature, such as for example: mechanical strength, elasticity,
35 resistance to thermal fronts and chemical and atmospheric agents, workability, flexibility, fineness,

length/diameter ratio. Also to be taken into account is the economic aspect: it is apparent that too expensive glass fibers cannot be put on the market so as to be competitive.

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Therefore, greatly felt is a need for a glass fiber composition having a good biological degradability combined with good features with reference to the above mentioned chemical, physical and mechanical properties.

- 10 In particular, obtaining an economically convenient glass fiber composition having a good biological degradability and at the same time a good resistance to water and humidity is very complicated because the last-mentioned requirement can be hardly reconciled with fibers having
15 a good tendency to dissolve in biological media.

- More generally, that which is complicated is coordinating the economical requirements of an industrial production with bio-solubility and with the strength requirements
20 that a fiber must have in order to be able to fulfill the present uses.

- It is therefore an aim of the present invention to provide a glass fiber composition which is sufficiently
25 bio-soluble and has a good resistance if brought into contact with water and/or humidity, a good workability, by use of centrifugal techniques for example, a capability of achieving a good heat/soundproof insulation, a good elasticity and reduced brittleness.

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It is a further aim of the present invention to provide a glass fiber composition having reduced production costs.

- 35 In an attempt to reach the above-mentioned aims, compositions were proposed in the past in which the SiO_2

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other: magnesium oxide reduces viscosity less than calcium oxide. Calcium oxide and magnesium oxide also affect the biological degradability of the glass fibers.

- 5 In accordance with the invention, use of the combination of the two oxides ($\text{CaO}+\text{MgO}$) in a percent by weight higher than 9 appeared to be advantageous. In particular a MgO content higher than or equal to 2.5 percent by weight appeared to be useful, the calcium oxide oscillations
10 being included in a range between 6.5 and 8 percent by weight.

- Sodium oxide (Na_2O) and potassium oxide (K_2O) affect the glass degradability making it higher. At the same time,
15 sodium oxide and potassium oxide also increase the water-solubility of glass. In both cases, the potassium oxide contribution is lower than the sodium oxide contribution. The two alkaline oxides also act on the glass viscosity and therefore the glass capability of being formed into
20 fibers. As already mentioned, viscosity is a parameter of the greatest importance as regards glass workability and formation into fibers. In addition, the two alkaline oxides also somewhat affect the glass brittleness. A compromise between economical factors, industrial
25 workability, brittleness, biological degradability and resistance to water was obtained by combining the two alkaline oxides ($\text{Na}_2\text{O}+\text{K}_2\text{O}$) in a percentage by weight higher than 18. Preferably and originally, the combination of the two alkaline oxides ($\text{Na}_2\text{O}+\text{K}_2\text{O}$) in
30 percent by weight is higher than or equal to 18.50 and lower than or equal to 23. In particular, Na_2O is present in a concentration by weight included between 17.70 and 18.50. In turn, potassium oxide is present in a concentration by weight included between zero and 2 and
35 more preferably it is present in a concentration by weight included between 0.50 and 1.50. It should be noted

that an increase in the concentration by weight of Al_2O_3 follows an increase in the concentration by weight of Na_2O because the glass viscosity, notwithstanding the possible presence of K_2O , becomes too low and therefore
5 an industrially unworkable glass would result.

Boron oxide (B_2O_3) advantageously contributes to the glass fiber elasticity. In particular, a felt of fibers having a good elasticity must be able to be compressed and, once
10 released, to take its original thickness again. Elasticity also helps in ensuring a good workability to the glass, above all during the operations for forming it into fibers. An elastic glass fiber surely is subject to less fractures. Since the alumina content was lowered
15 under 2% by weight and at the same time the Na_2O and K_2O content was increased in order to ensure a good bio-solubility, a weight amount of B_2O_3 , at least included between 4 and 15 and preferably between 5 and 15 was originally inserted in order to avoid too brittle a fiber
20 being obtained. At all events boron oxide B_2O_3 , also helps in reducing viscosity and has some repercussions from an economical point of view. In addition, boron oxide affects the biological degradability of glass fibers. For the reasons briefly discussed above, when an increase in
25 brittleness occurs, due to an increase in the alkali ($Na_2O + K_2O$) amount for example, the boron oxide component is increased in the composition but only to such an extent that the manufacturing cost of the glass is not increased too much. For instance (see the above-reproduced Example 1), if sodium oxide is present in a
30 high concentration by weight and aluminium oxide is present in a low concentration, the resulting fiber could be more brittle. In order to compensate for the resulting fiber brittleness, preferably a higher concentration by
35 weight of boron oxide is employed.

Ferric oxide (Fe_2O_3) acts on the biological degradability of glass fibers by decreasing it. Therefore it is useful for the ferric oxide to be present in a percentage by weight included between zero and a value not exceeding 5 0.5. Preferably, the ferric oxide is present in a percentage by weight included between 0.050 and 0.20.

Finally, in the components referred to as "others" it is provided to be included all impurities present in the 10 starting materials and not of particular importance for the composition of the invention, from a technical point of view.

Within the general idea of the embodiment being the 15 object of claim 1, particularly advantageous are the component ranges referred to in claim 5 surprisingly ensuring an excellent compromise between bio-solubility, structural features, workability and costs. In addition, advantageously, even if bio-solubility was facilitated 20 and improved due to relatively high concentrations by weight of the alkaline oxides, the fiber brittleness effects caused by the latter are mitigated through an increase in B_2O_3 to such an extent that the fiber-forming features and production costs are not impaired.

25 More specifically, in accordance with the concrete form disclosed in claim 6 a good biological degradability was obtained and an increase in the combination ($B_2O_3 + P_2O_5$) was conceived in order to compensate for a reduction in 30 the amount by weight of Al_2O_3 and for an increase in the alkaline oxides that have reduced the structural resistance and increased the glass brittleness, respectively. In particular, the P_2O_5 action consists in efficiently increasing the structural features and bio- 35 solubility and the B_2O_3 component acts on the fiber elasticity, improves bio-solubility and does not reduce

the capability of the glass to be formed into fibers too much.

Still more specifically, in accordance with the concrete form disclosed in claim 7, it is also simultaneously solved the problem of protecting the apparatuses intended for producing the fiber because the relatively high concentrations of P_2O_5 involved (> 0.1 per cent by weight) increase the biological degradability but are dangerous, since P_2O_5 is an acid-hydrolysis hygroscopic oxide. In addition, P_2O_5 is rather expensive. A preferred embodiment of the composition of claim 7 is set out in claim 8, according to the ranges therein stated.

The composition reproduced in claim 9 represents a valid compromise between reducing the amount by weight of boron oxide in order to reduce the glass fiber costs, and limiting the damages caused to the furnaces due to a relatively high presence of phosphoric oxide. The embodiment of claim 10 represents a preferred form in accordance with claim 9.

Finally, a composition having a high concentration by weight of alumina in accordance with claim 13 surprisingly appears to be bio-soluble since magnesium oxide helps in increasing solubility and also ensures a better behaviour than calcium oxide when the fiber-forming operations are carried out. In an original manner, in the composition in accordance with claim 13, with an alumina increase there is not a corresponding variation in the calcium oxide content but an important increase in magnesium oxide and boron oxide content since one improves bio-sensitivity and the fiber-forming operations and the other improves elasticity and bio-solubility.

of the results is in mg per gram of tested glass. As can be seen the glass in Example 1 has a water-solubility value which is not much higher than 200 mg/g, and this is a typical value of standard glasses.

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The bio-degradability evaluated by bio-persistence tests in conformity with Protocol ECB/TM/26 rev. 7, 1998 gave rise, for fibers longer than 20 μ , to a weighted mean life of the fiber considerably lower than the 10 days required by the EEC directives 97/69/CE of 05.12.1997.

EXAMPLE NO. 2

A second glass fiber composition in accordance with the invention has the following components the concentrations of which are expressed in percent by weight:

	- SiO ₂ :	64.95;
	- Al ₂ O ₃ :	1.20;
	- CaO:	7.00;
20	- MgO:	2.50;
	- Na ₂ O:	17.80;
	- K ₂ O:	0.70;
	- B ₂ O ₃ :	4.40;
	- P ₂ O ₅ :	1.00;
25	- SO ₃ :	0.35;
	- Fe ₂ O ₃ :	0.10;
	- Others:	less than 2.

This glass was worked by centrifugal techniques. The value of the resistance to humidity detected by the DGG method is 32 mg/g. The bio-degradability evaluated by bio-persistence tests in conformity with Protocol ECB/TM/26 rev. 7, 1998 gave rise, for fibers longer than 20 μ , to a weighted mean life of the fiber considerably lower than the 10 days required by the EEC directives 97/69/CE of 05.12.1997.

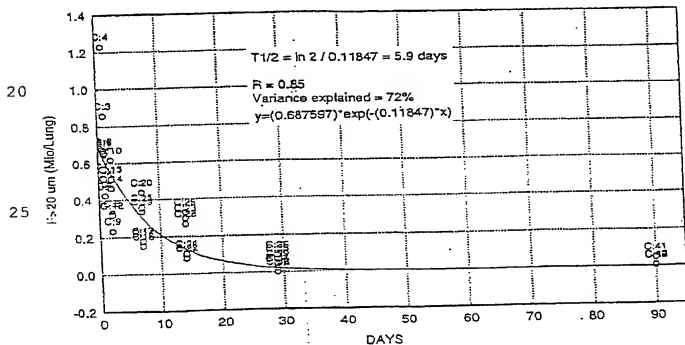
provisions of document EU ECB/TM/26 Rev. 7, 1998.

Based on the foregoing, the bio-persistence features of the fibers were determined by calculating the index of T_{1/2} mathematically describing the capability of the glass fibers to be evacuated from the pulmonary tissue of mice submitted to an experimental treatment.

As provided by the directives, the value of $T_{1/2}$ (lung
10 clearance half time) relates to fibers of a length
greater than 20μ .

Composition of Example 1

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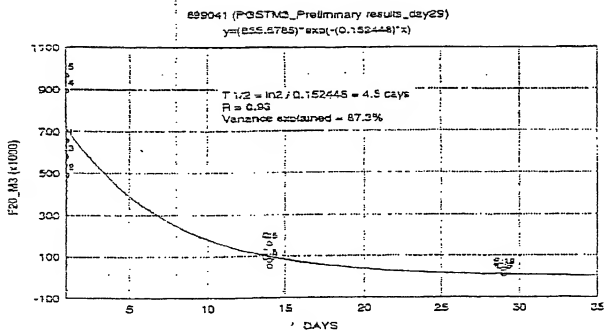
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PCT/IT00/00380

Composition of Example 2

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C L A I M S

1. A biologically-degradable or bio-soluble glass fiber composition, characterized in that it comprises the
- 5 following components expressed in percent by weight:
- SiO_2 : 61 to 66;
 - Al_2O_3 : 1.1 to 2.1;
 - $(\text{CaO}+\text{MgO})$: higher than 9;
 - $(\text{Na}_2\text{O}+\text{K}_2\text{O})$: higher than 18;
 - 10 - B_2O_3 : 4 to 15;
 - P_2O_5 : 0 to 5;
 - SO_3 : 0 to 1;
 - Fe_2O_3 : 0 to 0.5;
 - Others: less than 2.
- 15
2. The composition as claimed in claim 1, characterized in that it comprises the following components expressed in percent by weight:
- SiO_2 : 61 to 66;
 - 20 - Al_2O_3 : 1.1 to 2.1;
 - CaO : 6 to 9;
 - MgO : 0 to 5;
 - $(\text{Na}_2\text{O}+\text{K}_2\text{O})$: higher than 18;
 - B_2O_3 : 4 to 15;
 - 25 - P_2O_5 : 0 to 5;
 - SO_3 : 0 to 1;
 - Fe_2O_3 : 0 to 0.5;
 - Others: less than 2.
- 30
3. The composition as claimed in claim 1, characterized in that it comprises the following components expressed in percent by weight:
- SiO_2 : 61 to 66;
 - Al_2O_3 : 1.1 to 2.1;
 - 35 - $(\text{CaO}+\text{MgO})$: higher than 9;
 - Na_2O : higher than 17.5, lower than or equal

- to 23;
- K_2O : 0.6 to 2;
 - B_2O_3 : 4 to 15;
 - P_2O_5 : 0 to 5;
 - 5 - SO_3 : 0 to 1;
 - Fe_2O_3 : 0 to 0.5;
 - Others: less than 2.

4. The composition as claimed in anyone of the preceding
10 claims, characterized in that it comprises the following
components expressed in percent by weight:

- SiO_2 : 61 to 66;
- Al_2O_3 : 1.1 to 2.1;
- CaO : 6 to 9;
- 15 - MgO : 0 to 5;
- Na_2O : higher than 17.5, lower than or equal
to 23;
- K_2O : 0.6 to 2;
- B_2O_3 : 4 to 15;
- 20 - P_2O_5 : 0 to 5;
- SO_3 : 0 to 1;
- Fe_2O_3 : 0 to 0.5;
- Others: less than 2.

25 5. The composition as claimed in claim 4, characterized
in that it comprises the following components expressed
in percent by weight:

- SiO_2 : 61 to 66;
- Al_2O_3 : 1.1 to 1.80;
- 30 - $(CaO+MgO)$: higher than 9;
- Na_2O : 17.50 to 18.50;
- K_2O : 0.6 to 1;
- B_2O_3 : 5 to 15;
- P_2O_5 : 0 to 5;
- 35 - SO_3 : 0 to 1;
- Fe_2O_3 : 0 to 0.5;

- Others: less than 2.

6. The composition as claimed in claim 5, characterized in that it comprises the following components expressed in percent by weight:

- SiO_2 : 61 to 66;
- Al_2O_3 : 1.1 to 1.25;
- $(\text{CaO}+\text{MgO})$: higher than 9;
- Na_2O : 17.50 to 18.50;
- 10 - K_2O : 0.6 to 1;
- $(\text{B}_2\text{O}_3+\text{P}_2\text{O}_5)$: higher than 5;
- SO_3 : 0 to 1;
- Fe_2O_3 : 0 to 0.5;
- Others: less than 2.

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7. The composition as claimed in claim 6, characterized in that it comprises the following components expressed in percent by weight:

- SiO_2 : 61 to 66;
- 20 - Al_2O_3 : 1.1 to 1.25;
- $(\text{CaO}+\text{MgO})$: higher than 9;
- Na_2O : 17.50 to 18.50;
- K_2O : 0.6 to 1;
- B_2O_3 : higher than 5;
- 25 - P_2O_5 : 0 to less than 0.1;
- SO_3 : 0 to 1;
- Fe_2O_3 : 0 to 0.5;
- Others: less than 2.

30 8. The composition as claimed in claim 7, characterized in that it comprises the following components expressed in percent by weight:

- SiO_2 : 61 to 66;
- Al_2O_3 : 1.1 to 1.25;
- 35 - $(\text{CaO}+\text{MgO})$: higher than 9;
- Na_2O : 17.50 to 18.50;

- K_2O : 0.6 to 1;
- B_2O_3 : higher than 5.5;
- P_2O_5 : 0 to less than 0.1;
- SO_3 : 0 to 1;
- 5 - Fe_2O_3 : 0 to 0.5;
- Others: less than 2.

9. The composition as claimed in claim 6, characterized in that it comprises the following components expressed in percent by weight:

- SiO_2 : 61 to 66;
- Al_2O_3 : 1.1 to 1.25;
- $(CaO+MgO)$: higher than 9;
- Na_2O : 17.50 to 18.50;
- 15 - K_2O : 0.6 to 1;
- B_2O_3 : less than 5;
- P_2O_5 : 0.75 to 1.5;
- SO_3 : 0 to 1;
- Fe_2O_3 : 0 to 0.5;
- 20 - Others: less than 2.

10. The composition as claimed in claim 9, characterized in that it comprises the following components expressed in percent by weight:

- 25 - SiO_2 : 61 to 66;
- Al_2O_3 : 1.1 to 1.25;
- $(CaO+MgO)$: higher than 9;
- Na_2O : 17.50 to 18.50;
- K_2O : 0.6 to 1;
- 30 - B_2O_3 : less than 4.5;
- P_2O_5 : 0.75 to 1.5;
- SO_3 : 0 to 1;
- Fe_2O_3 : 0 to 0.5;
- Others: less than 2.

35

11. The composition as claimed in claim 5, characterized

in that it comprises the following components expressed in percent by weight:

- SiO_2 : 61 to 66;
- Al_2O_3 : 1.1 to 1.25;
- 5 - $(\text{CaO}+\text{MgO})$: higher than 9;
- Na_2O : 17.50 to 18.50;
- K_2O : 0.6 to 1;
- B_2O_3 : 5 to 15;
- P_2O_5 : 0 to 5;
- 10 - SO_3 : 0.1 to 0.5;
- Fe_2O_3 : 0 to 0.5;
- Others: less than 2.

12. The composition as claimed in claim 5, characterized in that it comprises the following components expressed in percent by weight:

- SiO_2 : 61 to 66;
- Al_2O_3 : 1.1 to 1.25;
- $(\text{CaO}+\text{MgO})$: higher than 9;
- 20 - Na_2O : 17.50 to 18.50;
- K_2O : 0.6 to 1;
- B_2O_3 : 5 to 15;
- P_2O_5 : 0 to 5;
- SO_3 : 0 to 1;
- 25 - Fe_2O_3 : 0.05 to 0.2;
- Others: less than 2.

13. The composition as claimed in claim 5, characterized in that it comprises the following components expressed in percent by weight:

- SiO_2 : 61 to 66;
- Al_2O_3 : 1.6 to 1.8;
- $(\text{CaO}+\text{MgO})$: higher than 9;
- MgO : higher than 3;
- 35 - MgO : preferably higher than 3.50;
- Na_2O : 17.50 to 18.50;

- K_2O : 0.6 to 1.5;
- B_2O_3 : 5 to 15;
- P_2O_5 : less than 0.1;
- SO_3 : less than 0.35;
- 5 - Fe_2O_3 : higher than zero;
- Others: less than 2.

14. The composition as claimed in claim 5, characterized in that it comprises the following components expressed
10 in percent by weight:

- | | | |
|----|---|--|
| | - SiO ₂ : | 61 to 66; |
| | - Al ₂ O ₃ : | 1.6 to 1.8; |
| | - (CaO+MgO): | higher than 9; |
| 15 | - (Na ₂ O+K ₂ O): | higher than or equal to 18.5 and
lower than or equal to 23; |
| | - K ₂ O: | 0.6 to 1.5; |
| | - B ₂ O ₃ : | 5 to 15; |
| | - P ₂ O ₅ : | less than 0.1; |
| | - SO ₃ : | 0.1 to 0.25; |
| 20 | - Fe ₂ O ₃ : | higher than 0; |
| | - Others: | less than 2. |

15. The composition as claimed in claim 5, characterized
in that it comprises the following components expressed
25 in percent by weight:

- | | | |
|----|--|--|
| | - SiO_2 : | 61 to 66; |
| | - Al_2O_3 : | 1.6 to 1.8; |
| | - $(\text{CaO}+\text{MgO})$: | higher than 9; |
| | - MgO : | higher than 3; |
| 30 | - MgO : | preferably higher than 3.50; |
| | - $(\text{Na}_2\text{O}+\text{K}_2\text{O})$: | higher than or equal to 18.5 and
lower than or equal to 23; |
| | - K_2O : | 0.6 to 1.5; |
| | - B_2O_3 : | 5 to 15; |
| 35 | - P_2O_5 : | less than 0.1; |
| | - SO_3 : | 0.1 to 0.25; |

- Fe_2O_3 : higher than 0;
- Others: less than 2.

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.
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(54) Title: A GLASS FIBER COMPOSITION

(57) Abstract: The invention relates to a biologically-degradable glass fiber composition having good mechanical properties, good workability and in particular fiber-forming-capability features and resistance to humidity. The concentrations expressed in percent by weight for each component being the object of the invention are: SiO₂: 61 to 66; Al₂O₃: 1.1 to 2.1; (Ca+MgO): higher than 9; (Na₂O+K₂O): higher than 18; B₂O₃: 4 to 15; P₂O₅: 0 to 5; SO₃: 0 to 1; Fe₂O₃: 0 to 0.5; Others: less than 2.

WO 01/23316 A1

Declaration and Power of Attorney for Patent Application**Dichiarazione e procura ai fini della domanda di brevetto****Italian Language Declaration**

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As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

A FIBER GLASS COMPOSITION

the specification of which is attached hereto unless the following box is checked:

- ☒ was filed on 9/27/00
 as United States Application Number or PCT
 International Application Number
PCT/IT00/00380 and was amended on _____
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I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

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Prior Foreign Application(s)
Domande Estere Anteriori

(Number) (Numero)	(Country) (Nazione)
(Number) (Numero)	(Country) (Nazione)

Il sottoscritto rivendica con la presente i benefici previsti dal Titolo 35, Codici degli Stati Uniti, § 119(e), in relazione a qualsiasi domanda o domande provvisorie degli Stati Uniti elencate sotto.

(Application No.) (N° della domanda)	(Filing Date) (Data di deposito)
(Application No.) (N° della domanda)	(Filing Date) (Data di deposito)

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Diritto di priorità non rivendicato

(Day/Month/Year Filed) (Giorno/Mese/Anno di deposito)	<input type="checkbox"/>
(Day/Month/Year Filed) (Giorno/Mese/Anno di deposito)	<input type="checkbox"/>

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MI99A002040 filed 9/30/99

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith: (list name and registration number).

Inviare le corrispondenza a:

Barry W. Sufrin, Reg. No. 27398 (1)
Send Correspondence to:

Telefonare a: (nome e numero telefonico)

Barry W. Sufrin, 312-661-2100
Direct Telephone Calls to: (name and telephone number)

Nome e cognome dell'unico o del primo inventore	Full name of sole or first inventor	Mr. Marco LA GRECA
Firma dell'inventore	Data	Inventor's signature Date MARCH 14 2002
Residenza	Residence	Via Vittorio Veneto; 9/4 PESCHIERA BORROMEO (MILANO)
Cittadinanza	Citizenship	italian
Recapito postale	Post Office Address	BUGNION S.P.A. Viale Lancetti, 17 MILANO - ITALY - ITX
Nome e cognome dell'eventuale secondo coinventore	Full name of second joint inventor, if any	Mr. Roberto MASSINI
Firma del secondo coinventore	Data	Second inventor's signature Date MARCH 14 2002
Residenza	Residence	Via Marchesi, 11 CARAVAGGIO (BERGAMO) - ITX
Cittadinanza	Citizenship	italian
Recapito postale	Post Office Address	BUGNION S.P.A. Viale Lancetti, 17 MILANO - ITALY -

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(Supply similar information and signature for third and subsequent joint inventors.)

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I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

A FIBER GLASS COMPOSITION

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the specification of which is attached hereto unless the following box is checked:

☒ was filed on 9/27/00
as United States Application Number or PCT
International Application Number
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Domande Estere Anteriori

(Number) (Numero)	(Country) (Nazione)
(Number) (Numero)	(Country) (Nazione)

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(Application No.) (N° della domanda)	(Filing Date) (Data di deposito)
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(Application No.)
(N° della domanda)

(Filing Date)
(Data di deposito)

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MI99A002040 filed 9/30/99

(Status) (patented, pending, abandoned)	(Stato) (concessione di brevetto, in corso di esame, abbandono)
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POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith: *(list name and registration number).*

Barry W. Sufrin, Reg. No. 27398

Inviare le corrispondenza a:

Send Correspondence to:

Barry W. Sufrin, 312-661-2100

Telefonare a: *(nome e numero telefonico)*Direct Telephone Calls to: *(name and telephone number)*

Nome e cognome dell'unico o del primo inventore	Full name of third ^{THIRD} inventor	Mr. JORGE PASALAIGUA HUGUET
Firma dell'inventore	Inventor's signature	Date 14/3/02
Residenza	Residence	C-ignasi Sarrò 1 43800 VALLS-TARRAGONA
Cittadinanza	Citizenship	SPANISH
Recapito postale	Post Office Address	BUGNION S.P.A.
		Viale Lancetti, 17 20158 MILANO - ITALY -
Nome e cognome dell'eventuale secondo coinventore	Full name of second joint inventor, if any	
Firma del secondo coinventore	Second inventor's signature	Date
Residenza	Residence	
Cittadinanza	Citizenship	
Recapito postale	Post Office Address	

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(Supply similar information and signature for third and subsequent joint inventors.)